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     (FILE 'HOME' ENTERED AT 10:18:10 ON 28 JUN 2007)

     FILE 'HCAPLUS' ENTERED AT 10:18:22 ON 28 JUN 2007
L1             1 SEA ABB=ON  PLU=ON  US2004106040/PN
                 D IALL
                 SEL RN

     FILE 'REGISTRY' ENTERED AT 10:19:17 ON 28 JUN 2007
L2             7 SEA ABB=ON  PLU=ON  (2768-02-7/BI OR 337529-55-2/BI OR
                 620168-38-9/BI OR 7440-21-3/BI OR 7440-44-0/BI OR
                 7631-86-9/BI OR 7782-42-5/BI)
                 D SCA
L3             1 SEA ABB=ON  PLU=ON  7440-21-3/RN
L4           706 SEA ABB=ON  PLU=ON  (SI(L)O)/ELS AND 2/ELC.SUB
L5             3 SEA ABB=ON  PLU=ON  L2 AND L4
                 D SCA
L6           492 SEA ABB=ON  PLU=ON  L4 AND 1<=O<1.7
L7           445 SEA ABB=ON  PLU=ON  L6 AND TIS/CI
L8           238 SEA ABB=ON  PLU=ON  L7 NOT 1.7-100/O
L9            97 SEA ABB=ON  PLU=ON  L8 NOT 0-0.9999/O
L10            2 SEA ABB=ON  PLU=ON  L2 AND L9

     FILE 'STNGUIDE' ENTERED AT 10:50:50 ON 28 JUN 2007

     FILE 'HCAPLUS' ENTERED AT 10:58:12 ON 28 JUN 2007
L11              QUE ABB=ON  PLU=ON  NEGATIVE?(A)ELECTROD## OR ANOD##
L12              QUE ABB=ON  PLU=ON  (NONAQ# OR NONAQUEOUS? OR NON(W)(AQ#
                 OR AQUEOUS?))(2A)ELECTROLY?
L13              QUE ABB=ON  PLU=ON  BATTERY
L14         2152 SEA ABB=ON  PLU=ON  L3(L)L11
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L15         1507 SEA ABB=ON  PLU=ON  L3(L)L13
L16          157 SEA ABB=ON  PLU=ON  L3(L)L12
L17          135 SEA ABB=ON  PLU=ON  L9(L)L11
L18          133 SEA ABB=ON  PLU=ON  L9(L)L13
L19           37 SEA ABB=ON  PLU=ON  L9(L)L12
L20          103 SEA ABB=ON  PLU=ON  L14 AND L15 AND L16
L21           30 SEA ABB=ON  PLU=ON  L17 AND L18 AND L19
L22              QUE ABB=ON  PLU=ON  PARTICLE?(2A)(SIZE? OR DIAMETER?)
L23         8891 SEA ABB=ON  PLU=ON  ACTIV?(3A)L11
L24           45 SEA ABB=ON  PLU=ON  L20 AND L23
L25           13 SEA ABB=ON  PLU=ON  L21 AND L23
L26            2 SEA ABB=ON  PLU=ON  L24 AND L22
L27            0 SEA ABB=ON  PLU=ON  L25 AND L22
L28           72 SEA ABB=ON  PLU=ON  L14 AND L22
L29            2 SEA ABB=ON  PLU=ON  L17 AND L22
L30           26 SEA ABB=ON  PLU=ON  L28 AND L23
L31            4 SEA ABB=ON  PLU=ON  L26 OR L29
L32       689843 SEA ABB=ON  PLU=ON  MU(W)M OR MICROMETER# OR MICRON#
L33           16 SEA ABB=ON  PLU=ON  L30 AND L32
L34            3 SEA ABB=ON  PLU=ON  L31 AND L32
L35            1 SEA ABB=ON  PLU=ON  L31 NOT L34
L36           14 SEA ABB=ON  PLU=ON  L33 NOT (L34 OR L35)
L37           10 SEA ABB=ON  PLU=ON  L30 NOT (L34 OR L35 OR L36)


=> fil hcap
FILE 'HCAPLUS' ENTERED AT 11:26:38 ON 28 JUN 2007
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FILE LAST UPDATED: 27 Jun 2007  (20070627/ED)

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 This file contains CAS Registry Numbers for easy and accurate
 substance identification.

=> d l34 ibib abs hitstr hitind 1-3

L34  ANSWER 1 OF 3  HCAPLUS  COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER:         2006:981509  HCAPLUS  Full-text
DOCUMENT NUMBER:          145:318064
TITLE:                    Nonaqueous electrolyte secondary lithium
                          batteries with silicon-containing anodes and
                          lithium transition metal oxide-containing
                          cathodes
INVENTOR(S):              Fukui, Atsushi; Sawa, Katsuichiro; Sunagawa,
```

Takuya; Kamino, Maruo
PATENT ASSIGNEE(S): Sanyo Electric Co., Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 20pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2006252999	A	20060921	JP 2005-68857	200503 11

PRIORITY APPLN. INFO.: JP 2005-68857 200503 11

AB The title batteries comprise Si-containing **anode active** materials, Li transition metal-containing mixed oxide cathode active materials, and the cathodes contain nonaq. electrolyte-retaining liquid having average **particle size** ≥1 nm and ≤10 **.mu.m** and BET sp. surface area ≥5 m2/g. Preferably, the powder is selected from Y oxide, Ce oxide, Si oxide, and Sn oxide. The batteries have high capacity and excellent charge-discharge characteristics.

IT **7440-21-3**, Silicon, uses
RL: DEV (Device component use)
(**anode active** material; **nonaq. electrolyte** secondary lithium **batteries** with silicon or silicon alloy **anodes** and lithium transition metal oxide cathodes also containing electrolyte-retaining powder)
RN 7440-21-3 HCAPLUS
CN Silicon (CA INDEX NAME)

Si

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
IT **7440-21-3**, Silicon, uses
RL: DEV (Device component use)
(**anode active** material; **nonaq. electrolyte** secondary lithium **batteries** with silicon or silicon alloy **anodes** and lithium transition metal oxide cathodes also containing electrolyte-retaining powder)

L34 ANSWER 2 OF 3 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2003:735270 HCAPLUS Full-text
DOCUMENT NUMBER: 139:263296
TITLE: Secondary nonaqueous electrolyte battery without anode deformation or electrolytic solution maldistribution and its manufacture
INVENTOR(S): Nakamoto, Takayuki; Nanai, Norishige; Bito, Yasuhiko; Kasamatsu, Shinji; Nitta, Yoshiaki
PATENT ASSIGNEE(S): Matsushita Electric Industrial Co., Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 13 pp.
CODEN: JKXXAF

DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2003263979	A	20030919	JP 2002-66651	200203 12

PRIORITY APPLN. INFO.: JP 2002-66651 200203 12

AB In manufacturing the battery, an anode is formed by filling an **anode active** substance with average **particle size** d 0.5-50 **.mu.m** into a current collector having continuous pores, sp. surface area 0.002-0.06 m2/g, and porosity 60-97%. In the obtained anode, 10-25 volume% of the continuous pores are filled with the active substance, and the rate of the bonding area between the active substance and the current collector to the surface area of the active substance is 5-40%. Since deformation of anode or maldistribution of an electrolytic solution during charging and discharging is prevented, the battery has high capacity and long cycle life.

IT **7440-21-3**, Silicon, uses
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)
(**anode active** substance; manufacture of **nonaq. electrolyte battery** without **anode** deformation or electrolytic solution maldistribution for high capacity and long cycle life)

RN 7440-21-3 HCAPLUS
CN Silicon (CA INDEX NAME)

Si

IC ICM H01M004-02
ICS H01M004-38; H01M004-66; H01M004-80; H01M010-40
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 56

IT Silicon alloy, base
Tin alloy, base
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)
(**anode active** substance; manufacture of nonaq. electrolyte battery without anode deformation or electrolytic solution maldistribution for high capacity and long cycle life)

IT **7440-21-3**, Silicon, uses 7440-31-5, Tin, uses 12787-61-0 57952-74-6
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)
(**anode active** substance; manufacture of **nonaq. electrolyte battery** without **anode** deformation or electrolytic solution maldistribution

for high capacity and long cycle life)

L34 ANSWER 3 OF 3 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2002:976165 HCAPLUS Full-text
DOCUMENT NUMBER: 138:42052
TITLE: Anode material containing coated silicon oxide for secondary nonaqueous-electrolyte battery
INVENTOR(S): Miyawaki, Satoru; Aramata, Mikio; Fukuoka, Hirofumi; Ueno, Susumu
PATENT ASSIGNEE(S): Shin-Etsu Chemical Industry Co., Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 6 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2002373653	A	20021226	JP 2001-181830	200106 15

PRIORITY APPLN. INFO.: JP 2001-181830 200106 15

AB The title anode material contains conductive SiOx powder containing SiOx having average **particle size** d50(A) 0.2-20 . **mu.m** coated with a conductive substance having average **particle size** d50(B) 20 nm to 13 **μ m** [where d50(A)/d50(B) ≥1.5] by mech. surface fusion treatment. Preferably, the anode contains SiOx (x = 0.6-1.5). The resulting battery has high capacity and long cycle life.

IT **113443-18-8P**, Silicon oxide (SiO)
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PNU (Preparation, unclassified); PYP (Physical process); PREP (Preparation); PROC (Process); USES (Uses)
(**anode** material containing coated silicon oxide for secondary nonaq.-electrolyte battery)
RN 113443-18-8 HCAPLUS
CN Silicon oxide (SiO) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	1	17778-80-2
Si	1	7440-21-3

IC ICM H01M004-58
ICS C01B033-113; H01M004-02; H01M004-04; H01M010-40
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
IT **113443-18-8P**, Silicon oxide (SiO)
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PNU (Preparation, unclassified); PYP (Physical process); PREP (Preparation); PROC (Process); USES (Uses)
(**anode** material containing coated silicon oxide for secondary nonaq.-electrolyte battery)

=> d 136 ibib abs hitstr hitind 1-14

L36 ANSWER 1 OF 14 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2007:463841 HCAPLUS Full-text
DOCUMENT NUMBER: 146:465271
TITLE: Methods of fabrication of battery anodes
INVENTOR(S): Konishiike, Isamu; Kawase, Kenichi
PATENT ASSIGNEE(S): Sony Corporation, Japan
SOURCE: U.S. Pat. Appl. Publ., 17pp.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2007092797	A1	20070426	US 2006-552434	200610 24
JP 2007122915	A	20070517	JP 2005-309997	200510 25

PRIORITY APPLN. INFO.: JP 2005-309997 A 200510 25

AB A battery using the anode, and methods of manufacturing the anode and the battery are provided. The battery is capable of relaxing stress while securing the contact characteristics between an anode current collector and an **anode active** material layer, and capable of improving the characteristics. The **anode active** material layer containing Si as an element is provided on the anode current collector. The **anode active** material layer includes a first **anode active** material layer having a first particle formed by being grown on the anode current collector by vapor-phase deposition method and a second **anode active** material layer having a second particle with an average **particle diameter** ranging from 0.2 .**mu.m** to 20 μ **m** which is deposited on the first **anode active** material layer by coating the first **anode active** material layer with the second particles.

IT **7440-21-3**, Silicon, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(methods of fabrication of battery **anodes**)
RN 7440-21-3 HCAPLUS
CN Silicon (CA INDEX NAME)

Si

INCL 429218100; 429200000; 427058000; 029623500
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
IT 872-36-6, 1,3-Dioxol-2-one **7440-21-3**, Silicon, uses
7782-44-7, Oxygen, uses 114435-02-8, 4-Fluoro-1,3-dioxolan-2-one
RL: TEM (Technical or engineered material use); USES (Uses)
(methods of fabrication of battery **anodes**)

L36 ANSWER 2 OF 14 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2007:257561 HCAPLUS Full-text
DOCUMENT NUMBER: 146:277797
TITLE: Lithium secondary batteries
INVENTOR(S): Fukui, Atsushi; Minami, Hiroshi; Kusumoto,

Yasuyuki
PATENT ASSIGNEE(S): Japan
SOURCE: U.S. Pat. Appl. Publ., 17pp.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2007054190	A1	20070308	US 2006-516523	20060907
JP 2007073334	A	20070322	JP 2005-259089	20050907
CN 1929167	A	20070314	CN 2006-10128177	20060906

PRIORITY APPLN. INFO.: JP 2005-259089 A 20050907

AB This battery consists of a cathode, an anode and a nonaq. electrolyte. The anode has current collector and a mixture layer containing a conductive agent, a binder and **anode- active** Si-containing material. The anode mixture layer is sintered and disposed on the anode current collector. The **anode active** material particles have an average **particle size** of 5.0-15.0 **.mu.m** before being charged. The anode conductive agent is made of a graphite material having an average **particle size** of 2.5-15.0 **.mu.m**. The amount of the graphite material added is from 3-20% with respect to the **anode active** material. The theor. elec. capacity ratio of the cathode to the anode is 1.0 or less.

IT **7440-21-3**, Silicon, uses
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(**anode** material for lithium secondary batteries)
RN 7440-21-3 HCAPLUS
CN Silicon (CA INDEX NAME)

Si

INCL 429218100; 429232000; 429217000
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
IT **7440-21-3**, Silicon, uses
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(**anode** material for lithium secondary batteries)

L36 ANSWER 3 OF 14 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2006:1031492 HCAPLUS Full-text
DOCUMENT NUMBER: 145:360198
TITLE: Secondary nonaqueous electrolyte battery
INVENTOR(S): Itaya, Masaharu; Fukui, Atsushi; Sawa, Shouichirou; Kusumoto, Yasuyuki; Fujimoto, Masahisa

PATENT ASSIGNEE(S): Sanyo Electric Co., Ltd., Japan
SOURCE: PCT Int. Appl., 30pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2006103829	A1	20061005	WO 2006-JP301843	200602 03

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, KE, KG, KM, KN, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW

RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM

JP 2006278124	A	20061012	JP 2005-95091	200503 29

PRIORITY APPLN. INFO.: JP 2005-95091 A 200503 29

AB The battery has an anode containing Si as an **anode active** material, a cathode, and a nonaq. electrolyte solution; where the **anode active** mass has an average **particle diameter** 5-20 .**mu.m** and further contains CO; the weight of the **anode active** mass is ≥10% of the electrolyte solution; and the weight of the CO2 is ≤3.7% of the **anode active** mass.

IT **7440-21-3**, Silicon, uses
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(**anodes** containing silicon with controlled **particle size** and amount)
RN 7440-21-3 HCAPLUS
CN Silicon (CA INDEX NAME)

Si

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
IT Battery anodes
Secondary batteries
(anodes containing silicon with controlled **particle size** and amount)
IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate
21324-40-3, Lithium hexafluorophosphate
RL: DEV (Device component use); USES (Uses)
(anodes containing silicon with controlled **particle**

size and amount)
IT **7440-21-3**, Silicon, uses
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(**anodes** containing silicon with controlled **particle** **size** and amount)
IT 124-38-9, Carbon dioxide, miscellaneous
RL: MSC (Miscellaneous)
(anodes containing silicon with controlled **particle** **size** and amount)
REFERENCE COUNT: 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L36 ANSWER 4 OF 14 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2006:819464 HCAPLUS Full-text
DOCUMENT NUMBER: 145:214415
TITLE: Manufacture of silicon-containing **anode** **active** mass for secondary lithium batteries, and same anodes and batteries
INVENTOR(S): Asao, Masaya; Kawakami, Soichiro
PATENT ASSIGNEE(S): Canon Inc., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 23pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2006216277	A	20060817	JP 2005-25589	200502 01
PRIORITY APPLN. INFO.:			JP 2005-25589	200502 01

AB The **anode** **active** mass is manufactured by a process consisting of steps of (1) wet pulverizing Si-based powders into fine **particles** with average **diameter** of 0.1-0.5 . **mu.m** and BET sp. surface area of 30-100 m2/g, and (2) dry pulverizing the resultant Si-based fine particles, carbon powders, and metal powders containing ≥1 elements selected from Sn, Al, Zn, In, Bi, Pb, and Mg to give composite **particles** with average **diameter** of 0.6-20 .**mu.m** and sp. surface area of 0.1-29 m2/g. In the dry pulverizing step, metal powders containing ≥1 elements selected from Ag, Co, Ni, Cu, Fe, Mn, W, V, Mo, Nb, Ti, Zr, Cr, Ta, Y, La, and Se may also be added. The batteries show high discharge capacity per unit volume of the **anode** **active** mass, and excellent charge-discharge cycling characteristics.
IT **7440-21-3**, Silicon, uses
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process)
(powder, composites with carbon and metals, **anode** **active** mass; manufacture of secondary lithium battery **anode** **active** mass containing composite powders of silicon, metals, and carbon)
RN 7440-21-3 HCAPLUS
CN Silicon (CA INDEX NAME)

Si

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

IT Pulverization
(dry; manufacture of secondary lithium battery **anode active** mass containing composite powders of silicon, metals, and carbon)

IT Composites
(from silicon, carbon, and metals, **anode active** mass; manufacture of secondary lithium battery **anode active** mass containing composite powders of silicon, metals, and carbon)

IT Secondary batteries
(lithium; manufacture of secondary lithium battery **anode active** mass containing composite powders of silicon, metals, and carbon)

IT Battery anodes
(manufacture of secondary lithium battery **anode active** mass containing composite powders of silicon, metals, and carbon)

IT Pulverization
(wet; manufacture of secondary lithium battery **anode active** mass containing composite powders of silicon, metals, and carbon)

IT Silicon alloy, base
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(powder, composites with carbon and metals, **anode active** mass; manufacture of secondary lithium battery **anode active** mass containing composite powders of silicon, metals, and carbon)

IT 7439-89-6, Iron, uses 7440-50-8, Copper, powder, uses
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process)
(composites with silicon and carbon and metals, **anode active** mass; manufacture of secondary lithium battery **anode active** mass containing composite powders of silicon, metals, and carbon)

IT 7440-31-5, Tin, powder, uses
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process)
(composites with silicon and carbon, **anode active** mass; manufacture of secondary lithium battery **anode active** mass containing composite powders of silicon, metals, and carbon)

IT 7429-90-5, Aluminum, powder, uses
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process)
(powdered, composites with silicon and carbon, **anode active** mass; manufacture of secondary lithium battery **anode active** mass containing composite powders of silicon, metals, and carbon)

IT **7440-21-3**, Silicon, uses
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process)
(powder, composites with carbon and metals, **anode active** mass; manufacture of secondary lithium battery **anode active** mass containing composite powders of

silicon, metals, and carbon)

IT 7439-91-0, Lanthanum, uses 7439-96-5, Manganese, uses 7439-98-7, Molybdenum, uses 7440-02-0, Nickel, uses 7440-03-1, Niobium, uses 7440-22-4, Silver, uses 7440-25-7, Tantalum, uses 7440-32-6, Titanium, uses 7440-33-7, Tungsten, uses 7440-36-0, Antimony, uses 7440-42-8, Boron, uses 7440-47-3, Chromium, uses 7440-48-4, Cobalt, uses 7440-62-2, Vanadium, uses 7440-65-5, Yttrium, uses 7440-67-7, Zirconium, uses 7723-14-0, Phosphorus, uses 7782-49-2, Selenium, uses
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process)
(powder, composites with silicon and carbon and metals, **anode active** mass; manufacture of secondary lithium battery **anode active** mass containing composite powders of silicon, metals, and carbon)

IT 7439-92-1, Lead, uses 7439-95-4, Magnesium, uses 7440-66-6, Zinc, uses 7440-69-9, Bismuth, uses 7440-74-6, Indium, uses
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process)
(powder, composites with silicon and carbon, **anode active** mass; manufacture of secondary lithium battery **anode active** mass containing composite powders of silicon, metals, and carbon)

IT 7440-44-0, Carbon, uses 7782-42-5, Graphite, uses
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process)
(powder, composites with silicon and metals, **anode active** mass; manufacture of secondary lithium battery **anode active** mass containing composite powders of silicon, metals, and carbon)

L36 ANSWER 5 OF 14 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2006:519744 HCAPLUS Full-text
DOCUMENT NUMBER: 145:66260
TITLE: Core/shell structure **active** material of **negative electrode** of secondary lithium battery
INVENTOR(S): Li, Hong; Hu, Jin; Huang, Xuejie; Chen, Liquan
PATENT ASSIGNEE(S): Institute of Physics, Chinese Academy of Sciences, Peop. Rep. China
SOURCE: Faming Zhuanli Shenqing Gongkai Shuomingshu, 24 pp.
CODEN: CNXXEV
DOCUMENT TYPE: Patent
LANGUAGE: Chinese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
CN 1681145	A	20051012	CN 2004-10030990	20040405
PRIORITY APPLN. INFO.:			CN 2004-10030990	20040405

AB Title active material, with **particle size** of 100 nm to 100 .**mu.m**, comprises core and shell; wherein the core comprises composite particles including 20-95 wt% of

10 nm to 50 .mu.m spherical powder selected from one or more of silicon and lithium storage transition metal compound (with thermodn. equilibrium potential less than 1.5 V) of VO, V2O3, VO2, CrO, Mn2O3, Nb2O5, etc., and conductive additives (such as graphite powder); and the shell comprises at least one continuous carbon layer. .

IT **7440-21-3**, Silicon, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(core/shell structure **active** material of **neg. electrode** of secondary lithium battery)

RN 7440-21-3 HCAPLUS
CN Silicon (CA INDEX NAME)

Si

IC ICM H01M004-36
ICS H01M004-62; H01M004-58; H01M004-02
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST **active** material **neg electrode** secondary lithium battery
IT Nanotubes
(carbon; core/shell structure **active** material of **neg. electrode** of secondary lithium battery)
IT Carbon black, uses
RL: NUU (Other use, unclassified); USES (Uses)
(conductive additive, core/shell structure **active** material of **neg. electrode** of secondary lithium battery)
IT Secondary batteries
(lithium; core/shell structure **active** material of **neg. electrode** of secondary lithium battery)
IT 7782-42-5, Graphite, uses
RL: NUU (Other use, unclassified); USES (Uses)
(conductive additive, core/shell structure **active** material of **neg. electrode** of secondary lithium battery)
IT 1308-38-9, Chromic oxide, uses 1313-96-8, Niobium pentaoxide 1314-34-7, Vanadium trioxide 1317-34-6, Manganese trioxide 1344-43-0, Manganese oxide (MnO), uses **7440-21-3**, Silicon, uses 12018-00-7, Chromium oxide (CrO) 12018-34-7, Chromium oxide (Cr3O4) 12034-57-0, Niobium oxide (NbO) 12034-59-2, Niobium dioxide 12035-98-2, Vanadium oxide (VO) 12036-21-4, Vanadium dioxide
RL: TEM (Technical or engineered material use); USES (Uses)
(core/shell structure **active** material of **neg. electrode** of secondary lithium battery)
IT 7440-44-0, Carbon, uses
RL: NUU (Other use, unclassified); USES (Uses)
(nanotubes; core/shell structure **active** material of **neg. electrode** of secondary lithium battery)

L36 ANSWER 6 OF 14 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2006:321854 HCAPLUS Full-text
DOCUMENT NUMBER: 144:334307
TITLE: Anodes for secondary lithium batteries with improved initial charge discharge efficiency
INVENTOR(S): Kusumoto, Yasuyuki; Torimae, Mariko; Itaya, Shoji; Sayama, Katsunobu

PATENT ASSIGNEE(S): Sanyo Electric Co., Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 11 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2006092928	A	20060406	JP 2004-277452	200409 24

PRIORITY APPLN. INFO.: JP 2004-277452 200409 24

AB The **anodes** have Si (alloy) **active** mass particles and electroconductive agents containing magnetic metal particles with average **particle size** ≤1 μm in anode mix layers. The anodes show suppressed internal resistance.

IT **7440-21-3**, Silicon, uses
RL: DEV (Device component use); USES (Uses)
(**anodes** for secondary lithium batteries with improved initial charge discharge efficiency)

RN 7440-21-3 HCAPLUS
CN Silicon (CA INDEX NAME)

Si

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

IT 7439-89-6, Iron, uses 7440-02-0, Nickel, uses **7440-21-3**, Silicon, uses 7440-48-4, Cobalt, uses
RL: DEV (Device component use); USES (Uses)
(**anodes** for secondary lithium batteries with improved initial charge discharge efficiency)

L36 ANSWER 7 OF 14 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2004:1019056 HCAPLUS Full-text
DOCUMENT NUMBER: 142:9210
TITLE: Anode material for secondary nonaqueous electrolyte battery, its manufacture, and the battery which uses the material
INVENTOR(S): Zhang, Shou-wu; Kuba, Kanji; Watarai, Yusuke
PATENT ASSIGNEE(S): Mitsubishi Materials Corp., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 10 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2004335335	A	20041125	JP 2003-131275	200305

PRIORITY APPLN. INFO.: JP 2003-131275 09

200305 09

AB The anode material comprises composite particles, having ceramics coated on a part of Li-intercalating mineral particles; where the mineral particles contain Si, Sn and/or Zn as constituent element; and the ceramics are composed of an oxide, a nitride, or a carbide, which contains Si, Ti, Al and/or Zr, and covers 20-95% total surface of the mineral particles. The anode material is manufactured by preparing 0.02-20 .mu.m average **particle sized** mineral **particles**, comprising ≥1 substance selected from Si, metal silicide, B doped Si, P doped Si, Zn, Sn, Zn containing solid solution, Sn containing solid solution, Zn containing intermetallic compds., and Sn containing intermetallic compds.; soling a precursor organic mol. solution, which contains Si, Ti, Al and/or Zr, by hydrolysis reaction and dehydrative polycondensation; mixing the mineral particles with the sol to coat the sol on the mineral particles; gelatinizing the sol; and firing the gel in a nonoxidative atmospheric at 600-1300° for 0.5-3 h to form composite particles which have the ceramics coated on a part of the mineral particles. The battery uses the above material as an **anode active** mass.

IT **7440-21-3**, Silicon, uses **7440-21-3D**, Silicon, B doped
RL: DEV (Device component use); USES (Uses)
(manufacture of **anode** materials containing ceramics coated mineral particle for secondary batteries)

RN 7440-21-3 HCAPLUS
CN Silicon (CA INDEX NAME)

Si

RN 7440-21-3 HCAPLUS
CN Silicon (CA INDEX NAME)

Si

IC ICM H01M004-38
ICS H01M004-02; H01M010-40
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
IT 1344-28-1, Alumina, uses **7440-21-3**, Silicon, uses **7440-21-3D**, Silicon, B doped **7440-21-3D**, Silicon, P doped 12019-69-1 12688-08-3, Carbon titanium oxide 39345-87-4, Silicon carbide oxide 171089-01-3, Iron silicide (Fe0.2Si0.8)
RL: DEV (Device component use); USES (Uses)
(manufacture of **anode** materials containing ceramics coated mineral particle for secondary batteries)

L36 ANSWER 8 OF 14 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2004:1019055 HCAPLUS Full-text
DOCUMENT NUMBER: 142:9209
TITLE: Anode material for secondary nonaqueous electrolyte battery, its manufacture, and the

battery which uses the material
INVENTOR(S): Chang, Shou-Bin; Kuba, Kanji; Watarai, Yusuke
PATENT ASSIGNEE(S): Mitsubishi Materials Corp., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 12 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2004335334	A	20041125	JP 2003-131274	200305 09

PRIORITY APPLN. INFO.: JP 2003-131274 200305 09

AB The anode material comprises composite particles, having ceramics coated on a part or whole part of mineral particles which are capable of intercalating/decalating Li+; where the mineral particles contain Si, Sn and/or Zn as constituent element; and the ceramics are composed of an oxide, a nitride, or a carbide, which contains Si, Ti, Al and/or Zr. The anode material is manufactured by preparing 0.02-20 .mu.m average **particle sized** mineral **particles**, comprising ≥1 substance selected from Si, metal silicide, B doped Si, P doped Si, Zn, Sn, Zn containing solid solution, Sn containing solid solution, Zn containing intermetallic compds., and Sn containing intermetallic compds.; mixing the mineral particles with a precursor organic mol. solution, containing Si, Ti, Al and/or Zr; gelatinizing the mixture by hydrolysis reaction and dehydrative polycondensation; firing the gel mixture in a nonoxidative atmospheric at 600-1300° for 0.5-3 h to form composite particles which have the ceramics coated on a part or whole part of the mineral particles. The battery uses the above material as an **anode active** mass.

IT **7440-21-3**, Silicon, uses **7440-21-3D**, Silicon, B doped
RL: DEV (Device component use); USES (Uses)
(manufacture of **anode** materials containing ceramics coated mineral particle for secondary batteries)
RN 7440-21-3 HCAPLUS
CN Silicon (CA INDEX NAME)

Si

RN 7440-21-3 HCAPLUS
CN Silicon (CA INDEX NAME)

Si

IC ICM H01M004-38
ICS H01M004-02; H01M004-62; H01M010-40
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

IT 1344-28-1, Alumina, uses **7440-21-3**, Silicon, uses **7440-21-3D**, Silicon, B doped **7440-21-3D**, Silicon, P doped 12019-69-1 12688-08-3, Carbon titanium oxide 39345-87-4, Silicon carbide oxide 171089-01-3, Iron silicide (Fe0.2Si0.8)
RL: DEV (Device component use); USES (Uses)
(manufacture of **anode** materials containing ceramics coated mineral particle for secondary batteries)

L36 ANSWER 9 OF 14 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2004:905470 HCAPLUS Full-text
DOCUMENT NUMBER: 141:382156
TITLE: Method of preparation of **anode** **active** material for rechargeable lithium battery
INVENTOR(S): Sheem, Kyou-yoon; Matsubara, Keiko; Tsuno, Toshiaki; Takamuku, Akira
PATENT ASSIGNEE(S): S. Korea
SOURCE: U.S. Pat. Appl. Publ., 12 pp.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2004214085	A1	20041028	US 2004-752300	20040106
JP 2004214054	A	20040729	JP 2003-446	20030106
JP 3827642	B2	20060927		
KR 2004063802	A	20040714	KR 2004-262	20040105

PRIORITY APPLN. INFO.:
JP 2003-446 A 20030106
KR 2004-262 A 20040105

AB Disclosed is a neg. active material for a lithium rechargeable battery which includes an aggregate of Si porous particles, wherein the porous particles are formed with a plurality of voids therein, wherein the voids have an average diameter of between 1 nm and 10 . **mu.m**, and the aggregate has an average **particle** **size** of between 1 **.mu.m** and 100 **.mu.m**.

IT **7440-21-3**, Silicon, uses
RL: DEV (Device component use); USES (Uses)
(porous particles; method of preparation of **anode** **active** material for rechargeable lithium battery)

RN 7440-21-3 HCAPLUS
CN Silicon (CA INDEX NAME)

Si

IC ICM H01M004-40
ICS H01M004-58
INCL 429218100; 429221000; 429223000; 429220000; 429231950; 429231500; 252182100
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 56
ST **anode active** material rechargeable lithium battery
IT Secondary batteries
(lithium; method of preparation of **anode active** material for rechargeable lithium battery)
IT Battery anodes
Voids (structures)
(method of preparation of **anode active** material for rechargeable lithium battery)
IT 11099-22-2 11107-19-0 11148-21-3 12645-62-4 12661-90-4
39365-72-5 50944-37-1 50955-74-3 56728-61-1 58977-56-3
69255-78-3 71818-44-5 88872-55-3
RL: DEV (Device component use); USES (Uses)
(method of preparation of **anode active** material for rechargeable lithium battery)
IT 12201-89-7P, Nickel silicide (NiSi2)
RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(method of preparation of **anode active** material for rechargeable lithium battery)
IT **7440-21-3**, Silicon, uses
RL: DEV (Device component use); USES (Uses)
(porous particles; method of preparation of **anode active** material for rechargeable lithium battery)

L36 ANSWER 10 OF 14 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2004:612384 HCAPLUS Full-text
DOCUMENT NUMBER: 141:159850
TITLE: **Anode active** mass for secondary lithium battery its manufacture, and the battery
INVENTOR(S): Matsubara, Keiko; Tsuno, Toshiaki; Takakura, Akira; Shin, Hatsu Koh
PATENT ASSIGNEE(S): Samsung SDI Co., Ltd., S. Korea
SOURCE: Jpn. Kokai Tokkyo Koho, 15 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2004214054	A	20040729	JP 2003-446	20030106
JP 3827642	B2	20060927		
KR 2004063802	A	20040714	KR 2004-262	200401

				05
CN 1518144	A	20040804	CN 2004-10005090	200401 06
US 2004214085	A1	20041028	US 2004-752300	200401 06
PRIORITY APPLN. INFO.:			JP 2003-446	A 200301 06
			KR 2004-262	A 200401 05

AB The active mass comprises aggregates of porous particles, consisting of Si, and a plurality of voids formed inside of the particles having average pore size 10 nm-10 .**mu.m**; where the aggregates have an average **particle size** of 1-100 . **mu.m**. The active mass is manufactured by forming a quenched alloy by rapidly cooling an alloy melt, containing Si and ≥1 M element selected from Sn, Al, Pb, In, Ni, Co, Ag, Mn, Cu, Ge, Cr, Ti and Fe; removing the M element contained in the alloy by eluting the alloy with a M element dissolvable acid or alkali to obtain aggregates of Si porous particles. The battery has the above **anode active** mass.

IT **7440-21-3**, Silicon, uses
RL: CPS (Chemical process); DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(manufacture of **anode active** mass containing porous silicon particle aggregates for secondary lithium batteries)

RN 7440-21-3 HCAPLUS

CN Silicon (CA INDEX NAME)

Si

IC ICM H01M004-38
ICS H01M004-02; H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

IT Secondary batteries
(lithium; manufacture of **anode active** mass containing porous silicon particle aggregates for secondary lithium batteries)

IT Battery **anodes**
(manufacture of **anode active** mass containing porous silicon particle aggregates for secondary lithium batteries)

IT 7429-90-5, Aluminum, uses 7440-02-0, Nickel, uses **7440-21-3**, Silicon, uses
RL: CPS (Chemical process); DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(manufacture of **anode active** mass containing porous silicon particle aggregates for secondary lithium batteries)

IT 7647-01-0, Hydrochloric acid, processes 7664-93-9, Sulfuric acid, processes
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(manufacture of **anode active** mass containing porous silicon particle aggregates for secondary lithium batteries)

IT 11099-22-2 12201-89-7, Nickel silicide (NiSi2)
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(manufacture of **anode active** mass containing porous silicon particle aggregates for secondary lithium batteries)

L36 ANSWER 11 OF 14 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2001:579456 HCAPLUS Full-text
DOCUMENT NUMBER: 135:155233
TITLE: Graphite for battery anode, its manufacture, and secondary lithium battery using it
INVENTOR(S): Sugiura, Tsutomu; Kono, Taro; Hamada, Takeshi; Shoji, Hiromasa
PATENT ASSIGNEE(S): Nippon Steel Corp., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 9 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2001216964	A	20010810	JP 2000-24180	20000201

PRIORITY APPLN. INFO.: JP 2000-24180 20000201

AB The graphite has (1) rate of scale-like **particles** with **particle size** ≥4 and <200 μ **m** in the total **particles** with **particle size** ≥4 and <200 **.mu.m** ≤80%, (2) C content ≥90 weight%, (3) BET sp. surface area ≤7 m2/g, and (4) average **particle size** ≥4 and <200 **.mu.m**. The graphite is manufactured by the following steps: (1) purifying C precipitated during cooling of molten mixture of metal and C, (2) milling the resulting a C material with C content ≥90 weight% by using impeller mill, jet mill, Raymond mill, or ball mill, and (3) classifying the milled material with air. The metal-C mixture may be molten pig iron. The title battery using the graphite as **anode active** mass is also claimed. The graphite has high discharge capacity and the battery has long cycle life.

IT **7440-21-3**, Silicon, uses
RL: NUU (Other use, unclassified); USES (Uses)
(purification, milling, and classification of C precipitated from metal-C molten mixture for manufacturing graphite with high discharge capacity for Li battery **anode**)

RN 7440-21-3 HCAPLUS
CN Silicon (CA INDEX NAME)

Si

IC ICM H01M004-58
ICS C01B031-04; H01M004-02; H01M004-04; H01M010-40
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 54

IT 7439-89-6, Iron, uses 7440-02-0, Nickel, uses **7440-21-3**, Silicon, uses 7440-48-4, Cobalt, uses
RL: NUU (Other use, unclassified); USES (Uses)
(purification, milling, and classification of C precipitated from metal-C molten mixture for manufacturing graphite with high discharge capacity for Li battery **anode**)

L36 ANSWER 12 OF 14 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2001:579455 HCAPLUS Full-text
DOCUMENT NUMBER: 135:155232
TITLE: Graphite for battery anode, its manufacture, and secondary lithium battery using it
INVENTOR(S): Sugiura, Tsutomu; Kono, Taro; Hamada, Takeshi; Shoji, Hiromasa
PATENT ASSIGNEE(S): Nippon Steel Corp., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 8 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2001216963	A	20010810	JP 2000-24179	200002 01

PRIORITY APPLN. INFO.: JP 2000-24179 200002 01

AB The graphite has C content ≥90 and <99 weight% and average **particle size** ≤200 **.mu.m**. The graphite is manufactured by the following steps: (1) purifying C precipitated during cooling of molten mixture of metal and C, (2) milling the purified C by using impeller mill, jet mill, Raymond mill, or ball mill, and (3) classifying the milled C with air. The metal-C mixture may be steelmaking dust. The title battery using the graphite as **anode active** mass is also claimed. The graphite has high discharge capacity and the battery has long cycle life.

IT **7440-21-3**, Silicon, uses
RL: NUU (Other use, unclassified); USES (Uses)
(purification, milling, and classification of C precipitated from metal-C molten mixture for manufacturing graphite with high discharge capacity for Li battery **anode**)
RN 7440-21-3 HCAPLUS
CN Silicon (CA INDEX NAME)

Si

IC ICM H01M004-58
ICS C01B031-04; H01M004-02; H01M004-04; H01M010-40
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 55
IT 7439-89-6, Iron, uses 7440-02-0, Nickel, uses **7440-21-3**, Silicon, uses 7440-48-4, Cobalt, uses
RL: NUU (Other use, unclassified); USES (Uses)

(purification, milling, and classification of C precipitated from metal-C molten mixture for manufacturing graphite with high discharge capacity for Li battery **anode**)

L36 ANSWER 13 OF 14 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1999:572133 HCAPLUS Full-text
DOCUMENT NUMBER: 131:172716
TITLE: Electrodes, secondary batteries, and their manufacture
INVENTOR(S): Kawakami, Soichiro; Asao, Masaya; Kobayashi, Naoya; Kosuzu, Takeshi; Kimura, Hironao
PATENT ASSIGNEE(S): Canon K. K., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 50 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 11242954	A	19990907	JP 1998-30642	19980128
JP 3619000	B2	20050209		
CA 2228095	A1	19980728	CA 1998-2228095	19980128
CA 2228095	C	20020108		
US 6432585	B1	20020813	US 1998-14408	19980128
JP 2005044814	A	20050217	JP 2004-290296	20041001

PRIORITY APPLN. INFO.:	JP 1997-13942	A	19970128
	JP 1997-369371	A	19971227
	JP 1998-30642	A3	19980128

AB The electrodes have a collector plate and active mass layers, containing ≥35% main component having average **particle diameter** 0.5-60 .**mu.m**, covering both sides of the collector. The active mass layer may have 10-86% porosity, the collector may have protrusions on their surface, and the main component contains Si, Ge, Sn, Pb, In, Mg, and/or Zn. The batteries are secondary batteries using the above electrodes as anodes. The electrodes and the secondary batteries using the anodes are prepared by forming the active mass layer on the collector, e.g., by painting or plating.

IT **7440-21-3**, Silicon, uses
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(compns. and structure and manufacture of **anodes** with

controlled **active** mass **particle diams**
. for batteries)
RN 7440-21-3 HCAPLUS
CN Silicon (CA INDEX NAME)

Si

IC ICM H01M004-02
ICS H01M004-02; H01M004-04; H01M004-38; H01M004-58; H01M004-62; H01M004-66; H01M004-70; H01M010-24; H01M010-40; H01M012-08
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
IT Battery anodes
(compns. and structure and manufacture of **anodes** with controlled **active** mass **particle diams**
. for batteries)
IT Fluoropolymers, uses
Polyanilines
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(compns. and structure and manufacture of **anodes** with controlled **active** mass **particle diams**
. for batteries)
IT Secondary batteries
(lithium; compns. and structure and manufacture of **anodes** with controlled **active** mass **particle diams**. for batteries)
IT 1313-99-1, Nickel oxide (NiO), uses 1314-13-2, Zinc oxide, uses 7429-90-5, Aluminum, uses 7440-02-0, Nickel, uses **7440-21-3**, Silicon, uses 7440-31-5, Tin, uses 7440-44-0, Carbon, uses 7440-50-8, Copper, uses 7440-69-9, Bismuth, uses 7440-74-6, Indium, uses 7782-42-5, Graphite, uses 9002-84-0 24937-79-9 25232-41-1, Poly(4-vinylpyridine) 37233-35-5 50926-11-9, Ito 145225-67-8 187674-56-2
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(compns. and structure and manufacture of **anodes** with controlled **active** mass **particle diams**
. for batteries)

L36 ANSWER 14 OF 14 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1995:746153 HCAPLUS Full-text
DOCUMENT NUMBER: 123:148980
TITLE: New **anode active** alloys for secondary alkaline batteries and the alloy anodes
INVENTOR(S): Sakamoto, Yoshiichi; Kuruma, Kenichiro; Hirano, Sadayuki; Hirata, Masahiro
PATENT ASSIGNEE(S): Tanaka Precious Metal Ind., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 4 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE

JP 07094187	A	19950407	JP 1993-261560	199309 24

PRIORITY APPLN. INFO.: JP 1993-261560 199309 24

AB The alloys are powders having **particle diameter** ≤100 .**mu.m** and are composed of a 1st transition metal containing d electrons and 20-50 atomic% a 2nd transition metal whose d orbit is incompletely or semi-completely filled. The 1st metal is Co or Fe and the 2nd metal is Mo or W. The alloys may also contain ≤5 atomic% B, ≤10 atomic% Si, or ≤20 weight% powdered Al2O3 or SiO2 having **particle diameter** ≤ 100 .**mu.m**. The anodes are prepared by press molding a mixture of the alloy powder and 4-10% PTFE.

IT **7440-21-3**, Silicon, uses
RL: MOA (Modifier or additive use); USES (Uses)
(additives in **anode active** alloys for secondary alkaline nickel batteries and the alloy **anodes**)

RN 7440-21-3 HCAPLUS

CN Silicon (CA INDEX NAME)

Si

IC ICM H01M004-52

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

IT 1344-28-1, Alumina, uses **7440-21-3**, Silicon, uses 7440-42-8, Boron, uses 7631-86-9, Silica, uses
RL: MOA (Modifier or additive use); USES (Uses)
(additives in **anode active** alloys for secondary alkaline nickel batteries and the alloy **anodes**)

IT 73482-78-7 166798-17-0 166798-18-1 166798-19-2 166798-20-5
RL: DEV (Device component use); USES (Uses)
(**anode active** alloys for secondary alkaline nickel batteries and the alloy anodes)

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L35 ANSWER 1 OF 1 HCAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER:	2002:936873 HCAPLUS Full-text
DOCUMENT NUMBER:	138:140003
TITLE:	SiOx-based anodes for secondary lithium batteries
AUTHOR(S):	Yang, J.; Takeda, Y.; Imanishi, N.; Capiglia, C.; Xie, J. Y.; Yamamoto, O.
CORPORATE SOURCE:	Department of Chemistry, Mie University, Mie, Tsu, 514-8507, Japan
SOURCE:	Solid State Ionics (2002), 152-153, 125-129 CODEN: SSIOD3; ISSN: 0167-2738
PUBLISHER:	Elsevier Science B.V.
DOCUMENT TYPE:	Journal
LANGUAGE:	English

AB Silicon oxide powders with different oxygen contents and **particle sizes** have been examined as anode materials for lithium-ion batteries. SiO0.8 electrode can provide a reversible capacity of .apprx.1600 mA-h/g over a voltage range 0.02-1.4

V vs. Li. The capacity drops with the increase in the oxygen content. Limited lithium insertion, however, alleviates the host volume expansion and thereby significantly improves the cyclability. In addition, the cycle performance is also dependent on the electrode fabrication method. By powder mixing and pressing, the electrode shows a larger insertion capacity, however the use of N-methylpyrrolidone solvent for dispersing poly(vinylidene difluoride) binder suppresses the capacity fade on cycling.

IT **107875-69-4**, Silicon oxide (SiO1.1) **113443-18-8**, Silicon oxide (SiO)
RL: DEV (Device component use); USES (Uses)
(silicon oxide-based **anodes** for lithium secondary batteries)

RN 107875-69-4 HCAPLUS
CN Silicon oxide (SiO1.1) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	1.1	17778-80-2
Si	1	7440-21-3

RN 113443-18-8 HCAPLUS
CN Silicon oxide (SiO) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	1	17778-80-2
Si	1	7440-21-3

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
IT 106496-83-7, Silicon oxide (SiO0.8) **107875-69-4**, Silicon oxide (SiO1.1) **113443-18-8**, Silicon oxide (SiO)
RL: DEV (Device component use); USES (Uses)
(silicon oxide-based **anodes** for lithium secondary batteries)
REFERENCE COUNT: 11 THERE ARE 11 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

=> d l37 ibib abs hitstr hitind 1-10

L37 ANSWER 1 OF 10 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2007:505188 HCAPLUS Full-text
DOCUMENT NUMBER: 146:484524
TITLE: **Anode active** material and battery
INVENTOR(S): Kawase, Kenichi; Takada, Tomoo; Yamamoto, Kensuke
PATENT ASSIGNEE(S): Sony Corporation, Japan
SOURCE: U.S. Pat. Appl. Publ., 10pp.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE

US 2007105017	A1	20070510	US 2006-555098	200610 31
JP 2007128766	A	20070524	JP 2005-321015	200511 04
PRIORITY APPLN. INFO.:			JP 2005-321015	A 200511 04

AB An **anode active** material capable of preventing shape deformation due to expansion and shrinkage and a battery using the anode are provided. An **anode active** material layer contains a powdery **anode active** material containing Si or Sn as an element. The average degree of circularity of the **anode active** material is 0.90 or less. By decreasing the average degree of circularity, the surface area becomes wide, and the reactive region becomes large. As a result, an intense local reaction is prevented, and the number of cracks resulting from expansion and shrinkage are reduced.

IT **7440-21-3**, Silicon, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(**anode active** material and battery)

RN 7440-21-3 HCAPLUS

CN Silicon (CA INDEX NAME)

Si

INCL 429218100; 252182100

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 56

ST **anode active** material battery

IT Battery **anodes**
Particle size
Secondary batteries
(**anode active** material and battery)

IT Fluoropolymers, uses
RL: MOA (Modifier or additive use); USES (Uses)
(**anode active** material and battery)

IT Metals, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(**anode active** material and battery)

IT Semimetals
RL: TEM (Technical or engineered material use); USES (Uses)
(**anode active** material and battery)

IT 24937-79-9, Polyvinylidene fluoride
RL: MOA (Modifier or additive use); USES (Uses)
(**anode active** material and battery)

IT **7440-21-3**, Silicon, uses 7440-31-5, Tin, uses
936020-26-7 936020-27-8
RL: TEM (Technical or engineered material use); USES (Uses)
(**anode active** material and battery)

IT 7782-42-5, Graphite, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(artificial; **anode active** material and battery)

IT 7440-44-0, Carbon, uses
RL: TEM (Technical or engineered material use); USES (Uses)

(mesocarbon microbeads, graphitized; **anode active** material and battery)

L37 ANSWER 2 OF 10 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2006:1141204 HCAPLUS Full-text
DOCUMENT NUMBER: 145:474786
TITLE: Method for preparing metal-embedded active carbon microsphere composite with high capacity and good cycle performance as lithium secondary battery anode material
INVENTOR(S): Wang, Ke; He, Xiangming; Ren, Jianguo; Wang, Li; Li, Jianjun; Pu, Weihua; Jiang, Changyin; Wan, Chunrong
PATENT ASSIGNEE(S): Tsinghua University, Peop. Rep. China
SOURCE: Faming Zhuanli Shenqing Gongkai Shuomingshu, 9pp.
CODEN: CNXXEV
DOCUMENT TYPE: Patent
LANGUAGE: Chinese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
CN 1851961	A	20061025	CN 2006-10012014	200605 26

PRIORITY APPLN. INFO.: CN 2006-10012014 200605 26

AB The title material contains 30-80 weight% of lithium storage active metal embedded in active carbon microspheres. The title method comprises grinding lithium storage active metal (such as Sn, Sn/Sb alloy, etc) or its oxide particles into fine powder, dissolving resorcinol and formaldehyde at a mole ratio of (1-3):1 into deionized water, adding basic catalyst and the fine powder at a mass ratio of powder/resorcinol of (0.2-1):1, adding the obtained mixed solution into oil phase in the presence of surfactant to obtain reverse micelle emulsion, stirring at 20-80° to obtain solid microspheres of phenol-formaldehyde resin gel, solid-liquid separating, vacuum-drying the separated solid to remove oil phase adhered to the surface of the microspheres, reacting under inert gas protection at 800-1200°, and naturally cooling. The material has the advantages of high capacity, good cycle performance, and low cost.

IT **7440-21-3P**, Silicon, uses
RL: PRP (Properties); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(method for preparing metal-embedded active carbon microsphere composite with high capacity and good cycle performance as lithium secondary battery **anode** material)
RN 7440-21-3 HCAPLUS
CN Silicon (CA INDEX NAME)

Si

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST **active** carbon microsphere **anode** tin antimony

copper silicon composite
IT Battery anodes
Carbonization
Composites
Electric capacitance
Microspheres
Particle size
(method for preparing metal-embedded active carbon microsphere composite with high capacity and good cycle performance as lithium secondary battery anode material)
IT **7440-21-3P**, Silicon, uses 7440-31-5P, Tin, uses 12668-36-9P 39460-91-8P
RL: PRP (Properties); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(method for preparing metal-embedded active carbon microsphere composite with high capacity and good cycle performance as lithium secondary battery **anode** material)

L37 ANSWER 3 OF 10 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2006:411606 HCAPLUS Full-text
DOCUMENT NUMBER: 144:453237
TITLE: Inorganic separator-electrode-unit for lithium-ion batteries, their production, and use
INVENTOR(S): Hoerpel, Gerhard; Hennige, Volker; Hying, Christian; Augustin, Sven
PATENT ASSIGNEE(S): Degussa A.-G., Germany
SOURCE: PCT Int. Appl., 38 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2006045339	A2	20060504	WO 2004-EP52605	200410 21

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW
RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM

PRIORITY APPLN. INFO.: WO 2004-EP52605 200410 21

AB The invention relates to separator-electrode-units (SEU) for Li batteries in addition to a method for their production The SEU have a porous electrode as a cathode or an anode which is suitable for a Li battery and a separator layer which is applied to the electrode. The SEU comprises (1) an inorg. separator layer containing ≥2 fractions of metal oxide particles which differ from each other by

the average **particle size** and/or the metal type and (2) an electrode having the active mass particles connected together and to the working electrode by means of the inorg. adhesive. The SEU can be produced in a simple manner as a component, and significantly higher temps. can be used during its production than in production of the conventional SEU because the electrodes do not contain any heat-sensitive organic materials.

IT **7440-21-3**, Silicon, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(in **anode active** mass for inorg.
separator-electrode-unit for lithium-ion batteries)
RN 7440-21-3 HCAPLUS
CN Silicon (CA INDEX NAME)

Si

IC ICM H01M004-36
ICS H01M002-14; H01M002-16; H01M004-48; H01M010-02
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
IT 1332-29-2, Tin oxide 7439-98-7, Molybdenum, uses 7440-03-1, Niobium, uses **7440-21-3**, Silicon, uses 7440-32-6, Titanium, uses 7440-33-7, Tungsten, uses 7440-44-0, Carbon, uses 7782-42-5, Graphite, uses 12057-24-8, Lithium oxide, uses 12070-08-5, Titanium carbide 12137-20-1, Titanium oxide (TiO) 25583-20-4, Titanium nitride (TiN) 50926-11-9, Indium tin oxide 53680-59-4 56451-30-0, Lithium titanium oxide (LiTiO3) 68848-64-6
RL: TEM (Technical or engineered material use); USES (Uses)
(in **anode active** mass for inorg.
separator-electrode-unit for lithium-ion batteries)

L37 ANSWER 4 OF 10 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2005:1305869 HCAPLUS Full-text
DOCUMENT NUMBER: 144:38366
TITLE: Manufacture of Li secondary battery **anodes** and their particulate **active** masses of long cycle life
INVENTOR(S): Kagawa, Hiroshi; Sada, Tsutomu; Hashimoto, Kanae
PATENT ASSIGNEE(S): Pionix Co., Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 24 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2005347147	A	20051215	JP 2004-166659	20040604

PRIORITY APPLN. INFO.: JP 2004-166659 20040604

AB The manufacturing process comprises these steps; alloying Si or Sn with the 1st metals to form alloy particles (A), surfacing (and alloying) them with the 2nd

metals, allowing them to adhere on low-fusible metal (or alloy) particles by methods chosen from mech. alloying, mech. grinding, mechanofusing, hybridizing, and/or sintering to form precursor particles, covering them with organic polymer solns. and firing (at 300-1000°) in inert atmospheric to form aggregates, i.e., active masses for Li secondary batteries, optionally bonding low-temperature-fired carbon, acetylene black, Ketjen black, carbon fibers, and/or graphite. The precursor **particles** have average **diameter** larger than A. Li secondary battery anodes coated on current collectors with the above active masses are further claimed.

IT **7440-21-3**, Silicon, uses
RL: PEP (Physical, engineering or chemical process); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(manufacture of lithium secondary battery **anodes** containing **active** mass particles of surface-alloyed composites)
RN 7440-21-3 HCAPLUS
CN Silicon (CA INDEX NAME)

Si

IC ICM H01M004-38
ICS H01M004-02; H01M004-04; H01M004-62; H01M010-40
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 56
ST lithium secondary battery anode silicon tin alloy; surface alloyed large battery **anode active** mass; alloyed tin cobalt aluminum adhering zinc battery anode
IT Carbon black, uses
RL: DEV (Device component use); IMF (Industrial manufacture); PREP (Preparation); USES (Uses)
(Ketjen black, acetylene black; manufacture of lithium secondary battery **anodes** containing **active** mass particles of surface-alloyed composites)
IT Carbonaceous materials (technological products)
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)
(**anode active** mass; manufacture of lithium secondary battery **anodes** containing **active** mass particles of surface-alloyed composites)
IT Sintering
(hot pressing; manufacture of lithium secondary battery **anodes** containing **active** mass particles of surface-alloyed composites)
IT Solders
(lead-free; manufacture of lithium secondary battery **anodes** containing **active** mass particles of surface-alloyed composites)
IT Secondary batteries
(lithium; manufacture of lithium secondary battery **anodes** containing **active** mass particles of surface-alloyed composites)
IT Battery anodes
(manufacture of lithium secondary battery **anodes** containing **active** mass **particles** of increased **diam**
. and with long cycle life)
IT Carburizing

Firing (heat treating)
(manufacture of lithium secondary battery **anodes** containing **active** mass particles of surface-alloyed composites)

IT Carbon fibers, uses
RL: DEV (Device component use); IMF (Industrial manufacture); PREP (Preparation); USES (Uses)
(manufacture of lithium secondary battery **anodes** containing **active** mass particles of surface-alloyed composites)

IT Grinding (machining)
(mech.; manufacture of lithium secondary battery **anodes** containing **active** mass particles of surface-alloyed composites)

IT Alloying
(surface; manufacture of lithium secondary battery **anodes** containing **active** mass particles of surface-alloyed composites)

IT 7439-95-4, Magnesium, uses 7440-36-0, Antimony, uses 7440-47-3, Chromium, uses 7440-48-4, Cobalt, uses 7440-69-9, Bismuth, uses
RL: MOA (Modifier or additive use); PEP (Physical, engineering or chemical process); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(amorphizing elements; manufacture of lithium secondary battery **anodes** containing **active** mass particles of surface-alloyed composites)

IT 7429-90-5, Aluminum, uses 7439-89-6, Iron, uses 7439-92-1, Lead, uses 7440-02-0, Nickel, uses 7440-50-8, Copper, uses 7440-66-6, Zinc, uses 11110-87-5 11124-13-3 11125-88-5 11144-61-9 12713-30-3 39460-91-8 226085-21-8
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)
(core particles; manufacture of lithium secondary battery **anodes** containing **active** mass particles of surface-alloyed composites)

IT 7440-44-0P, Carbon, uses 7782-42-5P, Graphite, uses
RL: DEV (Device component use); IMF (Industrial manufacture); PREP (Preparation); USES (Uses)
(manufacture of lithium secondary battery **anodes** containing **active** mass particles of surface-alloyed composites)

IT 583827-66-1P 871034-27-4P
RL: IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); PYP (Physical process); TEM (Technical or engineered material use); PREP (Preparation); PROC (Process); USES (Uses)
(manufacture of lithium secondary battery **anodes** containing **active** mass particles of surface-alloyed composites)

IT **7440-21-3**, Silicon, uses 7440-31-5, Tin, uses 868657-97-0 871034-26-3
RL: PEP (Physical, engineering or chemical process); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(manufacture of lithium secondary battery **anodes** containing **active** mass particles of surface-alloyed composites)

L37 ANSWER 5 OF 10 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2004:824974 HCAPLUS Full-text
DOCUMENT NUMBER: 141:334896
TITLE: **Anode active** material for rechargeable lithium battery
INVENTOR(S): Sheem, Kyou-Yoon; Matsubara, Keiko; Tsuno,

Toshiaki; Takamuku, Akira
PATENT ASSIGNEE(S): S. Korea
SOURCE: U.S. Pat. Appl. Publ., 8 pp.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2004197660	A1	20041007	US 2004-752297	20040106
JP 2004214055	A	20040729	JP 2003-447	20030106
KR 2004063803	A	20040714	KR 2004-263	20040105

PRIORITY APPLN. INFO.: JP 2003-447 A 20030106
KR 2004-263 A 20040105

AB Disclosed is a neg. active material for a rechargeable lithium battery including ultra-fine particles comprising an element which is capable of alloying with lithium. The **particles** have a **diameter** of 1 nm to 200 nm, a Raman shift of 480 cm -1 to 520 cm -1 measured by Raman Spectroscopy, and a full width at half-maximum of 10 cm-1 to 30 cm-1 .

IT **7440-21-3**, Silicon, uses
RL: DEV (Device component use); USES (Uses)
(**anode active** material for rechargeable lithium battery)
RN 7440-21-3 HCAPLUS
CN Silicon (CA INDEX NAME)

Si

IC H01M004-58
INCL 429231950
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST **anode active** material rechargeable lithium battery
IT Battery **anodes**
(**anode active** material for rechargeable lithium battery)
IT Secondary batteries
(lithium; **anode active** material for rechargeable lithium battery)
IT **7440-21-3**, Silicon, uses
RL: DEV (Device component use); USES (Uses)
(**anode active** material for rechargeable

lithium battery)

L37 ANSWER 6 OF 10 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2004:609464 HCAPLUS Full-text
DOCUMENT NUMBER: 141:143229
TITLE: **Anode active** mass for secondary lithium battery and the battery
INVENTOR(S): Matsubara, Keiko; Tsuno, Toshiaki; Takakura, Akira; Shin, Sen Koh
PATENT ASSIGNEE(S): Samsung SDI Co., Ltd., S. Korea
SOURCE: Jpn. Kokai Tokkyo Koho, 10 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2004214055	A	20040729	JP 2003-447	20030106
KR 2004063803	A	20040714	KR 2004-263	20040105
CN 1521873	A	20040818	CN 2004-10003853	20040106
US 2004197660	A1	20041007	US 2004-752297	20040106

PRIORITY APPLN. INFO.:
JP 2003-447 A 20030106
KR 2004-263 A 20040105

AB The active mass comprises a ultrafine particle powder, made of a Li alloyable element which has a **particle size** of 1-200 nm and is formed by evaporation in a gas atmospheric The battery has the above **anode active** mass.

IT **7440-21-3**, Silicon, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(**anodes** containing lithium alloyable elements with controlled ultrafine **particle size** for secondary lithium batteries)

RN 7440-21-3 HCAPLUS
CN Silicon (CA INDEX NAME)

Si

IC ICM H01M004-38
ICS H01M004-02; H01M010-40
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
IT Battery anodes

(anodes containing lithium alloyable elements with controlled ultrafine **particle size** for secondary lithium batteries)

IT Secondary batteries
(lithium; anodes containing lithium alloyable elements with controlled ultrafine **particle size** for secondary lithium batteries)

IT 7440-59-7, Helium, processes
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(anodes containing lithium alloyable elements with controlled ultrafine **particle size** for secondary lithium batteries)

IT **7440-21-3**, Silicon, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(**anodes** containing lithium alloyable elements with controlled ultrafine **particle size** for secondary lithium batteries)

L37 ANSWER 7 OF 10 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2004:412155 HCAPLUS Full-text
DOCUMENT NUMBER: 140:393396
TITLE: Secondary nonaqueous electrolyte battery
INVENTOR(S): Yamada, Masayuki; Morimoto, Hideyuki; Ueda, Atsushi; Aoyama, Shigeo
PATENT ASSIGNEE(S): Hitachi Maxell Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 13 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2004146104	A	20040520	JP 2002-306980	200210 22

PRIORITY APPLN. INFO.: JP 2002-306980 200210 22

AB The battery has a nonaq. electrolyte, a cathode, and an **anode**, containing **anode active** mass particles on a collector; where the thickness of the **anode active** mass layer is set to be 2 times larger than the average **particle size** of the **anode active** mass particle.

IT **7440-21-3**, Silicon, uses **7440-21-3D**, Silicon, containing Si/SiNi/Si2Ni phase
RL: DEV (Device component use); USES (Uses)
(secondary batteries containing **anode active** mass with controlled thickness based on their **particle size**)

RN 7440-21-3 HCAPLUS
CN Silicon (CA INDEX NAME)

Si

RN 7440-21-3 HCAPLUS
CN Silicon (CA INDEX NAME)

Si

IC ICM H01M004-02
ICS H01M004-38; H01M004-40; H01M004-62; H01M010-40
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST secondary battery anode **particle size** thickness control
IT Battery anodes
Secondary batteries
(secondary batteries containing **anode active** mass with controlled thickness based on their **particle size**)
IT Carbon fibers, uses
RL: DEV (Device component use); USES (Uses)
(secondary batteries containing **anode active** mass with controlled thickness based on their **particle size**)
IT **7440-21-3**, Silicon, uses **7440-21-3D**, Silicon, containing Si/SiNi/Si2Ni phase 7440-44-0, Carbon, uses 7782-42-5, Graphite, uses 12035-57-3D, Nickel silicide (NiSi), containing Si/SiNi/Si2Ni phase 12201-89-7D, Nickel silicide (NiSi2), containing Si/SiNi/Si2Ni phase 295782-50-2
RL: DEV (Device component use); USES (Uses)
(secondary batteries containing **anode active** mass with controlled thickness based on their **particle size**)

L37 ANSWER 8 OF 10 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2001:677124 HCAPLUS Full-text
DOCUMENT NUMBER: 135:213522
TITLE: Secondary nonaqueous electrolyte batteries
INVENTOR(S): Kasamatsu, Shinji; Shimamura, Harunari; Nitta, Yoshiaki
PATENT ASSIGNEE(S): Matsushita Electric Industrial Co., Ltd., Japan
SOURCE: PCT Int. Appl., 28 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2001067528	A1	20010913	WO 2001-JP1747	20010306
W: CN, KR, US RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR				
JP 2001325958	A	20011122	JP 2001-58323	20010302

US 2003096168	A1	20030522	US 2002-220885	200209 05
US 6911282	B2	20050628		
PRIORITY APPLN. INFO.:			JP 2000-61483	A 200003 07
			JP 2001-58323	A 200103 02
			WO 2001-JP1747	W 200103 06

AB The batteries use anodes containing graphite conductive **particles**, having median **diameter** Dc, and Li intercalating **particles**, having median **diameter** Da; where the Li intercalating particles have a Si and/or Sn core particle, coated with a solid solution or intermetallic compound layer containing the core component and ≥1 Group 2-14 element other than Si, Sn and C, and have Dc/Da = 0.02-0.5. Preferably, the coating is Ti2Si and Ti2Sn for Si and Sn cores, resp.

IT **7440-21-3**, Silicon, uses
RL: DEV (Device component use); USES (Uses)
(**anodes** from lithium intercalating particles with solid solution or intermetallic compound coatings for secondary lithium batteries)

RN 7440-21-3 HCAPLUS
CN Silicon (CA INDEX NAME)

Si

IC ICM H01M004-38
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST secondary lithium battery anode particle coating; silicon particle intermetallic compd coating battery anode; tin particle intermetallic compd coating battery anode; size ratio battery **anode active** mass conductor

IT **Particle size**
(controlled **particle size** ratio between graphite conductor and **anode active** mass in secondary lithium batteries)

IT 1313-08-2 **7440-21-3**, Silicon, uses 7440-31-5, Tin, uses 12039-83-7, Titanium silicide (TiSi2) 12201-89-7, Nickel silicide (NiSi2) 12510-35-9 77137-25-8, Titanium silicide (Ti2Si)
RL: DEV (Device component use); USES (Uses)
(**anodes** from lithium intercalating particles with solid solution or intermetallic compound coatings for secondary lithium batteries)

IT 7782-42-5, Graphite, uses
RL: DEV (Device component use); USES (Uses)
(controlled **particle size** ratio between graphite conductor and **anode active** mass in secondary lithium batteries)

REFERENCE COUNT: 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L37 ANSWER 9 OF 10 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1999:734159 HCAPLUS Full-text
DOCUMENT NUMBER: 131:312423
TITLE: Anodes for lithium batteries and their manufacture
INVENTOR(S): Chen, Liquan; Li, Guobao; Xue, Rongjian; Huang, Hong; Liu, Weifeng
PATENT ASSIGNEE(S): Physics Institute, Chinese Academy of Sciences, Peop. Rep. China
SOURCE: Faming Zhuanli Shenqing Gongkai Shuomingshu, 8 pp.
CODEN: CNXXEV
DOCUMENT TYPE: Patent
LANGUAGE: Chinese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
CN 1155765	A	19970730	CN 1996-100810	19960122
CN 1042875	B	19990407		

PRIORITY APPLN. INFO.: CN 1996-100810 19960122

AB The anodes contain 1-20% dispersing agents and 80-99% active mass mixts., which contains a 1st active mass 1-99% and a 2nd active mass 1-99%. The 1st active mass is selected from graphite, carbon fiber, petroleum coke, TiS2, Li3-xMxN (M = Ni, Co, and/or Cu; 0 <x <1), LiTi2O4, and BC2N; and the 2nd active mass is selected from Al, Sb, Bi, Si, Sn, Ga, In, Cd, Zn, Pb, Mg, Fe, and their Li alloys. The dispersing agent is PTFE, poly(vinylidene fluoride), ethylene propylene rubber, etc. The anodes are prepared by pulverizing electrode material to **particle size** 0.001-40 mm by mech. grinding and ultrasound, processing the powder to form thin films, and drying in vacuum at 140-250Φ' for 5-300 h.

IT **7440-21-3**, Silicon, uses
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(compns. of **anodes** containing different **active** mass dispersed in polymers for secondary lithium batteries)
RN 7440-21-3 HCAPLUS
CN Silicon (CA INDEX NAME)

Si

IC ICM H01M004-02
ICS H01M004-04; H01M004-36
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
IT Battery anodes
(compns. of **anodes** containing different **active** mass dispersed in polymers for secondary lithium batteries)
IT Ethylene-propylene rubber
Fluoropolymers, uses
RL: DEV (Device component use); PEP (Physical, engineering or

chemical process); PROC (Process); USES (Uses)
(dispersing binders in **anodes** containing different **active** mass dispersed in polymers for secondary lithium batteries)

IT Coke
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(needle; compns. of **anodes** containing different **active** mass dispersed in polymers for secondary lithium batteries)

IT 7429-90-5, Aluminum, uses 7439-89-6, Iron, uses 7439-92-1, Lead, uses 7439-95-4, Magnesium, uses **7440-21-3**, Silicon, uses 7440-31-5, Tin, uses 7440-36-0, Antimony, uses 7440-43-9, Cadmium, uses 7440-55-3, Gallium, uses 7440-66-6, Zinc, uses 7440-69-9, Bismuth, uses 7440-74-6, Indium, uses 7782-42-5, Graphite, uses 12039-13-3, Titanium sulfide 12798-95-7 26134-62-3D, Lithium nitride (Li3N), cobalt substituted 37217-08-6, Lithium titanium oxide (LiTi2O4) 120039-00-1, Boron carbide nitride (BC2N) 247906-48-5
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(compns. of **anodes** containing different **active** mass dispersed in polymers for secondary lithium batteries)

IT 9002-84-0 24937-79-9
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(dispersing binders in **anodes** containing different **active** mass dispersed in polymers for secondary lithium batteries)

IT 9010-79-1
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(ethylene-propylene rubber, dispersing binders in **anodes** containing different **active** mass dispersed in polymers for secondary lithium batteries)

L37 ANSWER 10 OF 10 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1999:114586 HCAPLUS Full-text
DOCUMENT NUMBER: 130:127418
TITLE: **Anode active** mass for high energy nickel/hydrogen batteries and its manufacture
INVENTOR(S): Pan, Shuming
PATENT ASSIGNEE(S): Peop. Rep. China
SOURCE: Faming Zhuanli Shenqing Gongkai Shuomingshu, 10 pp.
CODEN: CNXXEV
DOCUMENT TYPE: Patent
LANGUAGE: Chinese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
CN 1124411	A	19960612	CN 1994-118804	19941205
PRIORITY APPLN. INFO.:			CN 1994-118804	19941205

05

AB The **anode active** mass is (M1-p-rEpM'r)Ni5-x-y-z- q- kAlxMnyCozDqAk, where, M = La- or Ce-rich rare earth mixture; E = Nd; M' = Pr; D = Zr, Hf, V, Nb, Ta, Li, Mo, B, or Si; A = N, O, or H; and 0 ≤p ≤0.2, 0 ≤r ≤0.1, 0 ≤x ≤0.3, 0 ≤y ≤0.8, 0 ≤z ≤0.7, 0
≤q ≤0.1, and 0 ≤k ≤0.01. The manufacturing process consists of alloy smelting in Ar, stage crushing to **particle size** smaller than 0.048-0.074 mm, and chemical coating with Cu and/or Ni. Metal molds with good thermal conductivity are used to obtain fine columnar crystals.

IT **7440-21-3**, Silicon, uses
RL: DEV (Device component use); USES (Uses)
(compns. and structure and manufacture of rare earth-nickel hydrogen absorbing alloys for nickel battery **anodes**)

RN 7440-21-3 HCAPLUS

CN Silicon (CA INDEX NAME)

Si

IC ICM H01M004-36
ICS H01M004-26

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

IT 1333-74-0, Hydrogen, uses 7429-90-5, Aluminum, uses 7439-93-2, Lithium, uses 7439-96-5, Manganese, uses 7439-98-7, Molybdenum, uses 7440-00-8, Neodymium, uses 7440-03-1, Niobium, uses 7440-10-0, Praseodymium, uses **7440-21-3**, Silicon, uses 7440-25-7, Tantalum, uses 7440-42-8, Boron, uses 7440-48-4, Cobalt, uses 7440-58-6, Hafnium, uses 7440-62-2, Vanadium, uses 7440-67-7, Zirconium, uses 7727-37-9, Nitrogen, uses 7782-44-7, Oxygen, uses
RL: DEV (Device component use); USES (Uses)
(compns. and structure and manufacture of rare earth-nickel hydrogen absorbing alloys for nickel battery **anodes**)

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